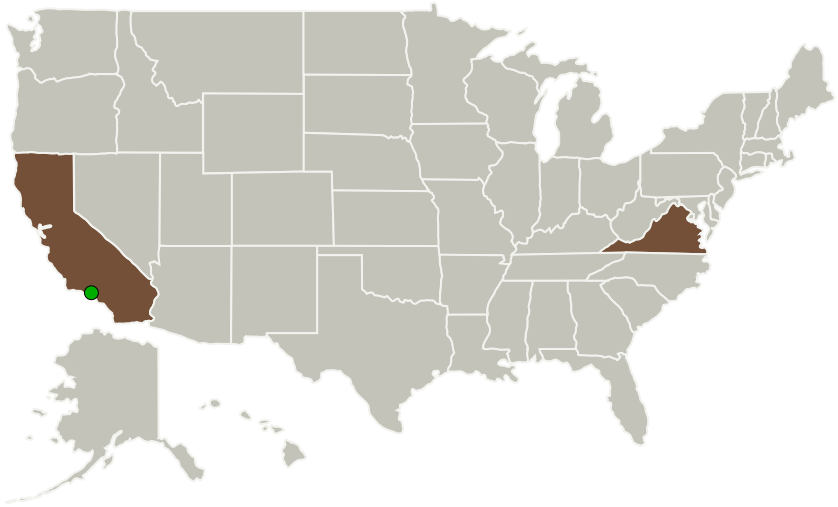
Frequency Multipliers for 200-400GHz, Phase I

Completed Technology Project (2015 - 2015)

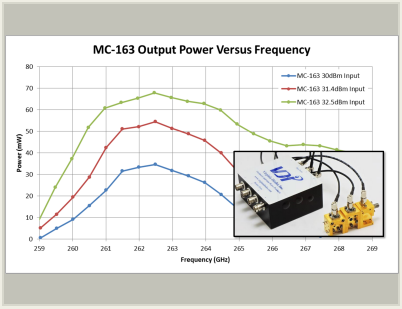
Project Introduction

This proposal is responsive to NASA SBIR Subtopic S1.02: Microwave Technologies for Remote Sensing, specifically the interest in frequency multipliers that can work in the 200-400GHz range (output frequency) with better than 30% efficiency and input powers up to 1W. VDI will employ three specific innovations to achieve the power and efficiency goals described in the solicitation. 1) Optimization of the use of diamond heat spreaders to achieve improved thermal management and therefore lower diode operating temperatures. 2) Development of a practical method of four-way, in-phase power combining within the multiplier housing. 3) The use of active biasing technology to ensure that the diodes are automatically at their optimal bias point even as the source frequency is rapidly tuned across the operating band. Additionally a prototype amplifier-multiplier chain will be delivered to NASA JPL, demonstrating the feasibility of these innovations.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Virginia Diodes, Inc.	Lead Organization	Industry	Charlottesville, Virginia
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California



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Primary U.S. Work Locations	
California	Virginia

Project Transitions

June 2015: Project Start

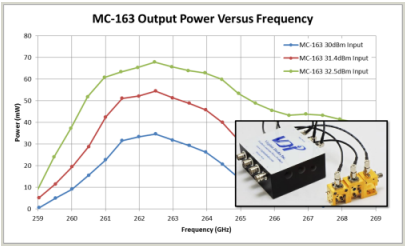
December 2015: Closed out

Closeout Summary: Frequency Multipliers for 200-400GHz, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/139021)*

Images



Briefing Chart Image
Frequency Multipliers for 200-400GHz, Phase I
(https://techport.nasa.gov/image/130160)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Virginia Diodes, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

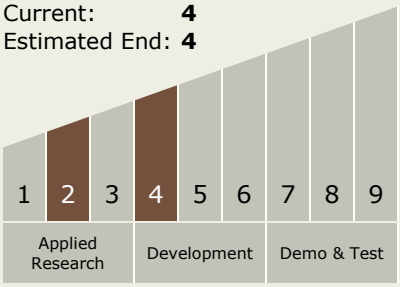
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Jeffrey L Hesler

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System